ESI

EnviroSystems, Inc.
One Lafayette Road
P.O. Box 778
Hampton, N.H. 03843-0778
p 603 926 3345 · f 603 926 3521
envirosystems.com

November 30, 2011

Mr. Peter Nyberg
United Water
Hull Wastewater Treatment Facility
1111 Nantasket Avenue
Hull, Massachusetts 02045

Dear Mr. Nyberg:

Enclosed, please find a copy of our report presenting the results of a toxicity test completed using an effluent sample collected from the Hull, Massachusetts Wastewater Treatment Facility during the November 2011 sampling period. Acute toxicity was evaluated using the inland silverside, *Menidia beryllina*.

Please do not hesitate to call me, Kirk Cram or Petra Karbe should you have any questions regarding the report.

Sincerely,

EnviroSystems, Incorporated

Kenneth A. Simon
President

Enclosure
WET Test Report Certification
Report Number 21614-11-11
One (1) copy + email

TOXICOLOGICAL EVALUATION
OF A TREATED MUNICIPAL EFFLUENT
BIOMONITORING SUPPORT FOR A NPDES PERMIT:
November 2011

Hull Wastewater Treatment Facility
Hull, Massachusetts
NPDES Permit Number MA0101231

Prepared For:

United Water
Hull Wastewater Treatment Facility
1111 Nantasket Avenue
Hull, Massachusetts 02045

Prepared By:

EnviroSystems, Incorporated
One Lafayette Road
Hampton, New Hampshire 03842

November 2011
Reference Number Hull 21614-11-11

STUDY NUMBER 21614

EXECUTIVE SUMMARY

The following summarizes the results of an acute exposure bioassay completed during November 2011 in support of the NPDES biomonitoring requirements of the Hull, Massachusetts Wastewater Treatment Facility, operated by United Water. The 48 hour acute definitive assay was completed using the inland silverside, *Menidia beryllina*.

M. beryllina were 9 days old at the start of the test. Dilution water was receiving water collected from Massachusetts Bay at a point away from the discharge.

Samples were received under chain of custody in good order. All sample receipt, test conditions and control endpoints were within protocol specifications except where otherwise noted. The results presented in this report relate only to the samples described on the chain(s) of custody and sample receipt log(s).

Results from the acute exposure assay and their relationship to permit limits are summarized in the following matrix.

Acute Toxicity Evaluation

Species	Exposure	LC-50	A-NOEC	Permit Limit (LC-50)	Effluent Meets Permit Limit	Assay Meets Protocol Limits
Menidia beryllina	48 Hours	>100%	100%	≥100%	Yes	Yes

TOXICOLOGICAL EVALUATION
OF A TREATED MUNICIPAL EFFLUENT
BIOMONITORING SUPPORT FOR A NPDES PERMIT:
November 2011

Hull Wastewater Treatment Facility
Hull, Massachusetts
NPDES Permit Number MA0101231

1.0 INTRODUCTION

This report presents the results of an acute toxicity test completed on a composite effluent sample collected from the Hull, Massachusetts Wastewater Treatment Facility (Hull WWTF), operated by United Water. Testing was based on programs and protocols developed by the US EPA (2002) and involved conducting a 48 hour static acute toxicity test with the inland silverside, *Menidia beryllina*. Testing was performed at EnviroSystems, Incorporated (ESI), Hampton, New Hampshire in accordance with the provisions of the NELAC Standards (2000).

Acute toxicity tests involve preparing a series of concentrations by diluting effluent with control water. Groups of test animals are exposed to each effluent concentration and a control for a specified period. In acute tests, mortality data for each concentration are used to calculate (by regression) the median lethal concentration, or LC-50, defined as the effluent concentration which kills half of the test animals. Samples with high LC-50 values are less likely to cause significant environmental impacts. The no-effect concentration is also determined to provide information about the level of effluent which would have minimal acute effects in the environment. This Acute No Observed Effect Concentration (A-NOEC) is defined as the highest tested effluent concentration which causes no significant mortality.

2.0 MATERIALS AND METHODS

2.1 General Methods

Toxicological and analytical protocols used in this program follow procedures primarily designed by the EPA to provide standard approaches for the evaluation of toxicological effects of discharges on aquatic organisms, and for the analysis of water samples. See Section 4.0 for a list of references.

2.2 Test Species

When necessary, *M. beryllina* were acclimated to approximate test conditions prior to use in the assay. Test organisms were transferred to test chambers using a large bore glass pipet, minimizing the amount of water added to test solutions. Twenty control fish were weighed during the test to confirm loading rates. The loading rate was below the maximum 0.4 g/L loading rate recommended for assays conducted at 25°C. Fish weights and loading calculations are included in the data appendix.

2.3 Effluent, Receiving Water and Laboratory Water

Effluent and receiving water collection information is provided in Table 1. Samples were stored at 4°C and warmed to 25±1°C prior to preparing test solutions. Effluent used in the *M. beryllina* assay was salinity adjusted to 25±2 ppt using artificial sea salts according to protocol (EPA 2002). Laboratory water was collected from the Hampton/Seabrook Estuary. This water is classified as SA-1 and has been used to culture marine test organisms since 1981.

Total residual chlorine (TRC) was measured by amperometric titration (MDL 0.02 mg/L) in both the effluent and diluent samples. If chlorine was present in the sample, the sample was dechlorinated using sodium thiosulfate and a control assay using laboratory water treated with an equal amount of sodium thiosulfate was run concurrently. Data for the sodium thiosulfate laboratory control can be found in Appendix A.

2.4 Acute Toxicity Test

The 48 hour static acute toxicity test was conducted at 25±1°C with a photoperiod of 16:8 hours light:dark. Test chambers were 250 mL glass beakers containing 200 mL test solution in each of 4 replicates with 10 organisms/replicate. Test concentrations for the assay were 100%, 50%, 25%, 12.5%, and 6.25% effluent. Survival and dissolved oxygen were recorded daily in all replicates. Specific conductivity, salinity, temperature, and pH were measured daily in one replicate of each test treatment.

2.5 Data Analysis

When applicable, statistical analysis of acute exposure data was completed using CETIS, Comprehensive Environmental Toxicity Testing System, software. The program computes acute exposure endpoints based on EPA decision tree guidelines specified in individual test methods. If survival in the highest test concentration is >50%, the LC-50 is obtained by direct observation of the raw data.

2.6 Quality Control

As part of the laboratory quality control program, standard reference toxicant assays are completed on a regular basis for each test species. These results provide relative health and response data while allowing for comparison with historic data sets. See Table 2 for details.

3.0 RESULTS AND DISCUSSION

Results of the acute exposure bioassay completed using the inland silverside are summarized in Table 3. Effluent and dilution water characteristics are presented in Table 4. US EPA Region I toxicity test summary sheet can be found after the tables. Support data, including copies of the laboratory bench sheets, are included in Appendix A.

Minimum test acceptability criteria require ≥90% survival in the control concentrations. Achievement of these results indicate that healthy test organisms were used and that the dilution water had no significant adverse impact on the outcome of the assay. See the Executive Summary and Table 3 for test acceptability.

4.0 LITERATURE CITED

APHA. 1998. *Standard Methods for the Examination of Water and Wastewater*, 20th Edition. Washington D.C.

National Environmental Laboratory Accreditation Conference: Quality Systems. Chapter 5. June 2000.

US EPA. 2002. *Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms.* Fifth Edition. EPA-821-R-02-012.

US EPA. 2008. *Attachment G: NPDES Whole Effluent Toxicity Testing, Monitoring and Reporting Tips and Common Pitfalls.* US EPA Region I Offices, Boston, Massachusetts.

TABLE 1. Summary of Sample Collection Information.
Hull WWTF Effluent Biomonitoring Program. November 2011.

Sample Description	Type	Collection Date	Collection Time	Receipt Date	Receipt Time	Arrival Temp °C
Effluent	Comp	11/01-02/11	0800-0800	11/02/11	0900	4
Receiving Water	Grab	11/02/11	0830	11/02/11	0900	4

TABLE 2. Summary of Reference Toxicant Data.
Hull WWTF Effluent Biomonitoring Program. November 2011.

Date	Endpoint		Value	Historic Mean/ Central Tendency	Acceptable Range	Reference Toxicant
M. beryllina						
10/26/11	Survival	LC-50 - 48 Hr	8.2	7.3	4.3 - 10.4	SDS (mg/L)

Means and Acceptable Ranges based on the most recent 20 reference toxicant assays

TABLE 3. Summary of Acute Evaluation Results.
Hull WWTF Effluent Biomonitoring Program. November 2011.

		Percent Survival						
Species	Exposure	Lab	RW	6.25%	12.5%	25%	50%	100%
M. beryllina	48 hours	100%	100%	100%	100%	100%	100%	100%

LC-50 and A-NOEC Results

Species	Exposure	Spearman-Karber	Probit	A-NOEC
M. beryllina	48 Hours	NC	NC	100%

COMMENTS:
RW - Receiving Water; used as diluent for assay
NC - The LC-50 value could not be computed by this method for this data set.

TABLE 4. Summary of Effluent and Diluent Characteristics.
Hull WWTF Effluent Biomonitoring Program. November 2011.

PARAMETER	UNIT	EFFLUENT	RECEIVING WATER
Specific Conductivity - As Received	µmhos/cm	8050	45290
Specific Conductivity - Salinity Adjusted	µmhos/cm	39880	39390
pH - As Received	SU	7.78	7.05
pH - Salinity Adjusted	SU	7.88	7.84
Salinity - As Received	ppt	5	29
Salinity - Salinity Adjusted	ppt	25	25
Total Residual Chlorine	mg/L	<0.02	<0.02
Total Solids	mg/L	5200	37000
Total Suspended Solids	mg/L	8.1	62
Ammonia as N	mg/L	0.38	<0.1
Total Organic Carbon	mg/L	5.4	<0.4
Aluminum, total	mg/L	0.04	0.081
Cadmium, total	mg/L	<0.0005	<0.0009
Chromium, total	mg/L	<0.002	<0.002
Copper, total	mg/L	0.014	0.033
Lead, total	mg/L	0.0005	0.015
Nickel, total	mg/L	<0.002	<0.002
Zinc, total	mg/L	0.042	0.079

COMMENTS:

Additional water quality and analytical support chemistry data are available in Appendix A.

TOXICITY TEST SUMMARY SHEET

FACILITY NAME: Hull WWTF
NPDES PERMIT NO.: MA0101231
TEST START DATE: 11/03/11
TEST END DATE: 11/05/11

TEST TYPE
X Acute
___Chronic
___Modified Chronic (Reporting Acute Values)
___24 Hour Screen

TEST SPECIES
___*Pimephales promelas*
___*Ceriodaphnia dubia*
___*Daphnia pulex*
___*Americamysis bahia*
___*Cyprinodon variegatus*
X *Menidia beryllina*
___*Arbacia punctulata*
___*Champia parvula*
___*Selenastrum capricornutum*

SAMPLE TYPE
___Prechlorinated
___Dechlorinated
___Chlorine Spiked in Lab
___Chlorinated on Site
___Unchlorinated
X No Detectable Chlorine Upon Receipt

SAMPLE METHOD
___Grab
X Composite
___Flow-thru
___Other

DILUTION WATER:

X Receiving water collected at a point upstream or away from the discharge, free from toxicity or other sources of contamination; Receiving Water Name: Massachusetts Bay

___Alternate surface water of known quality and hardness, to generally reflect the characteristics of the receiving water; Receiving Water Name: _____

___Synthetic water prepared using either Millipore Milli-Q or equivalent deionized water and reagent grade chemicals; or deionized water combined with mineral water.

___Artificial sea salts mixed with deionized water

___Deionized water and hypersaline brine

___Other

EFFLUENT SAMPLING DATES: 11/01-02/11 _____ _____ _____

EFFLUENT CONCENTRATIONS TESTED (%): 6.25; 12.5; 25.0; 50.0; 100

Permit Limit Concentration: ≥100 %

Was the effluent salinity adjusted? Yes If yes, to what level? 25 ppt

REFERENCE TOXICANT TEST DATE: 10/26/11 LC-50: 8.2 mg/L Sodium Dodecyl Sulfate

PERMIT LIMITS AND TEST RESULTS

Test Acceptability Criteria

Mean Control Survival: 100% _____

LIMITS		**RESULTS**	
LC-50:	≥100 %	LC-50	>100 %
		Upper Limit:	- %
A-NOEC:	- %	Lower Limit:	- %
		Method:	Direct Observation
C-NOEC:	- %	A-NOEC:	100 %
		C-NOEC:	- %
		LOEC:	-
IC- ___	- %	IC- _____	- %

APPENDIX A

DATA SHEETS

STATISTICAL SUPPORT

METHODS USED IN NPDES PERMIT BIOMONITORING TESTING

Parameter	Method
Acute Exposure Bioassays:	
Ceriodaphnia dubia	EPA-821-R-02-012 2002.0
Daphnia pulex	EPA-821-R-02-012 2021.0
Pimephales promelas	EPA-821-R-02-012 2000.0
Americamysis bahia	EPA-821-R-02-012 2007.0
Menidia beryllina	EPA-821-R-02-012 2006.0
Cyprinodon variegatus	EPA-821-R-02-012 2004.0
Chronic Exposure Bioassays:	
Ceriodaphnia dubia	EPA-821-R-02-013 1002.0
Pimephales promelas	EPA-821-R-02-013 1000.0
Cyprinodon variegatus	EPA-821-R-02-014 1004.0
Menidia beryllina	EPA-821-R-02-014 1006.0
Arbacia punctulata	EPA-821-R-02-014 1008.0
Champia parvula	EPA-821-R-02-014 1009.0
Trace Metals:	
Trace Metals	EPA 200.7/SW 6010 and EPA 200.8/SW 6020
Hardness	Standard Methods 20th Edition - Method 2340 B
Wet Chemistries:	
Alkalinity	EPA 310.2
Chlorine, Residual	Standard Methods 20th Edition - Method 4500CLD
Total Organic Carbon	Standard Methods 20th Edition - Method 5310C
Specific Conductance	Standard Methods 20th Edition - Method 2510B
Nitrogen - Ammonia	Standard Methods 20th Edition - Method 4500NH3G
pH	Standard Methods 20th Edition - Method 4500H+B
Solids, Total (TS)	Standard Methods 20th Edition - Method 2540 B
Solids, Total Dissolved (TDS)	Standard Methods 20th Edition - Method 2540 C
Solids, Total Suspended (TSS)	Standard Methods 20th Edition - Method 2540 D
Dissolved Oxygen	Standard Methods 20th Edition - Method 4500-O G

Please visit our web site at www.envirosystems.com for a copy of our NH NELAP Accreditation and Massachusetts State Certification.

ACUTE BIOASSAY DATA SUMMARY

STUDY: 21614

CLIENT: United Water

SAMPLE: Hull WWTF Effluent

DILUENT: Receiving Water

TEST ORGANISM: *M. beryllina*

ORGANISM SUPPLIER/ BATCH / AGE: *See Organism Culture Sheet*

"AS RECEIVED" EFFLUENT AND DILUENT CHEMISTRIES

	TRC	TS/S	AMM	TOC	METALS	SAL	pH	S/C
EFF	<0.02	005	004	003	002	4.5	7.78	8050
DIL	<0.02	010	009	008	007	29.4	7.05	45200

SALINITY ADJUSTMENT RECORD : 4000 ML EFFLUENT + 95 G SEA SALTS = 100% ACTUAL PERCENTAGE
4000 mL Diluent + 1000 mL DI H_2O = 80% Actual %

CONC	REP	SURVIVAL 0	SURVIVAL 24	SURVIVAL 48	DO (mg/L) 0	DO (mg/L) * 24	DO (mg/L) 48	pH (SU) 0	pH (SU) 24	pH (SU) 48	TEMP (°C) 0	TEMP (°C) 24	TEMP (°C) 48	S/C (µmhos/cm) 0	S/C (µmhos/cm) 24	S/C (µmhos/cm) 48	SALINITY (ppt) 0	SALINITY (ppt) 24	SALINITY (ppt) 48
LAB	A	10	10	10	7.2	4.2	7.0	8.04	7.46	7.89	24	24	24	39000	39620	39500	25	25	25
	B	10	10	10	7.2	3.7	6.9												
	C	10	10	10	7.2	3.9	4.9												
	D	10	10	10	7.2	4.2	4.9												
Rec' Water	A	10	10	10	7.7	4.3	7.1	7.84	7.46	7.94	24	24	24	39390	40160	40790	25	26	26
	B	10	10	10	7.7	4.7	7.1												
	C	10	10	10	7.7	4.8	7.1												
	D	10	10	10	7.7	4.3	7.1												
6.25%	A	10	10	10	7.7	3.8	7.2	7.84	7.48	8.00	24	24	24	39400	40210	41210	25	26	26
	B	10	10	10	7.7	4.2	7.2												
	C	10	10	10	7.7	4.4	7.2												
	D	10	10	10	7.7	4.4	7.0												
12.5%	A	10	10	10	7.8	4.4	7.2	7.85	7.48	8.03	24	24	24	39540	40320	41110	25	26	26
	B	10	10	10	7.8	4.3	7.2												
	C	10	10	10	7.8	4.3	7.2												
	D	10	10	10	7.8	4.4	7.1												
DATE		11/3/11	11/4	11/5	11/3/11	11/4	11/5												
TIME		1500	1350	1430	1445	1335	1410												
INITIALS		CS	UB	UB	CS	UB	UB												

* on air day 1

ACUTE BIOASSAY DATA SUMMARY

STUDY: 21614

CLIENT: United Water

TEST ORGANISM: *M. beryllina*

SAMPLE: Hull, MA WWTF

DILUENT: Receiving Water

"AS RECEIVED" EFFLUENT AND DILUENT CHEMISTRIES

	TRC	TS/S	AMM	TOC	ALK	HARD	SAL
EFF			See	Page	1		
DIL							

CONC	REP	SURVIVAL 0	SURVIVAL 24	SURVIVAL 48	DO (mg/L) 0	DO (mg/L) 24	DO (mg/L) 48	pH (SU) 0	pH (SU) 24	pH (SU) 48	TEMP (°C) 0	TEMP (°C) 24	TEMP (°C) 48	S/C (µmhos/cm) 0	S/C (µmhos/cm) 24	S/C (µmhos/cm) 48	SALINITY (ppt) 0	SALINITY (ppt) 24	SALINITY (ppt) 48
25%	A	10	10	10	7.7	3.9	6.9	7.85	7.50	8.06	24	24	24	39580	40420	41210	25	26	26
	B	10	10	10	7.7	4.2	7.0												
	C	10	10	10	7.7	4.6	7.0												
	D	10	10	10	7.7	4.3	7.1												
50%	A	10	10	10	7.9	4.4	7.2	7.87	7.60	8.13	24	24	24	39640	40420	41380	25	26	26
	B	10	10	10	7.9	4.5	7.2												
	C	10	10	10	7.9	4.3	6.8												
	D	10	10	10	7.9	4.3	7.0												
100%	A	10	10	10	8.2	4.6	7.1	7.88	7.70	8.19	24	24	24	39880	40390	41590	25	26	27
	B	10	10	10	8.2	4.3	4.7												
	C	10	10	10	8.2	4.5	6.3												
	D	10	10	10	8.2	4.6	7.1												
DATE		11/3/11	11/4	11/5	11/3/11	11/4	11/5												
TIME		1500	1350	1430	1445	1335	1410												
INITIALS		CS	UB	UB	CS	UB	UB												

Organism Wet Weights

Study:	21614
Client:	Hull WWTF
Date/Time/Intials:	11/03/11 1530 CS
Start/End?:	START

Rep	
1	0.01025
2	0.01021
3	0.01243
4	0.00948
5	0.00577
6	0.0095
7	0.00411
8	0.01345
9	0.00949
10	0.01187
11	0.00427
12	0.01072
13	0.00239
14	0.00289
15	0.00344
16	0.003
17	0.00983
18	0.0054
19	0.00227
20	0.00941

Mean Weight (g):	0.0073647368
Test Volume (L):	0.2
Loading Rate(g/L):	0.3682368421

Aquatic Research Organisms

DATA SHEET

rec. 11/3/11

I. Organism History

Species Mysidopsis bahia

Source: Lab reared ✓ Hatchery reared _____ Field collected _____

Hatch date 10-25-11 Receipt date _____

Lot number 102211 MB Strain _____

Brood origination Cape Cod MA

II. Water Quality

Temperature 25 °C Salinity ≈25 ppt D.O. — ppm

pH 7.8 su Hardness — ppm Alkalinity — ppm

III. Culture Conditions

Freshwater _____ Saltwater ✓ Other _____

Recirculating ✓ Flow through _____ Static renewal _____

DIET: Flake food ✓ Phytoplankton _____ Trout chow _____

Artemia ✓ Rotifers ✓ YCT _____ Other Encap. Shrimp Diet

Prophylactic treatments: _____

Comments: _____

_____

IV. Shipping Information

Client: ESI # of Organisms 3207

Carrier: _____ Date shipped 11-3-11

Biologist: Mark Voorhees

PO BOX 1271 HAMPTON NH 03843-1271 (603) 926-1650 AROFISH@AOL.COM

RECORD OF METERS USED

STUDY: 21614	CLIENT: United Water - Hull, MA WWTF	
Exposure (Hours)		
	0	24	48
Water Quality Station #	2	2	2
Initials / Date	CS 11/3/14	UB 11/4	UB 11/5

Water Quality Station #1		Water Quality Station #2		COMMENTS
DO meter #		DO meter #	23	
DO probe #		DO probe #	90	
pH meter #		pH meter #	470	
pH probe #		pH probe #	101	
S/C meter #		S/C meter #	Y5130E	
S/C probe #		S/C probe #	↓	
Salinity meter #		Salinity meter #	↓	

PREPARATION OF DILUTIONS

Diluent: Receiving Water (RW)	Day: 0 Sample:	
Concentration %	Vol. Eff.(mls)	Final Vol.(mls)
Lab	0	800
RW	0	↓
6.25%	50	↓
12.5%	100	↓
25%	200	↓
50%	400	↓
100%	800	↓
INITIALS:	CS	
TIME:	1435	
DATE:	11/3/14	

Report No: 21614 SDG:
Project: Hull

Sample ID: Effluent Start
Matrix: Water
Sampled: 11/02/11 0800

Parameter		Result	Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Total solids	21614-005	5200	10	mg/L	11/05/11	11/05/11 0944	EAL/SM2540B
Total suspended solids	21614-005	8.1	5	mg/L	11/05/11	11/05/11 1030	EAL/SM 2540D
Total organic carbon	21614-003	5.4	0.4	mg/L	11/21/11	11/21/11	EAL/SM 5310 C
Ammonia-N	21614-004	0.38	0.1	mg/L as N	11/21/11 1436	11/21/11 1436	JLH/SM 4500-NH3 G
Aluminum, total	21614-002	0.04	0.02	mg/L	11/14/11 1230	11/15/11	JLH/EPA 200.8
Cadmium, total	21614-002	ND	0.0005	mg/L	11/14/11 1230	11/15/11	JLH/EPA 200.8
Calcium, total	21614-002	65	0.05	mg/L	11/14/11 1230	11/15/11	JLH/EPA 200.8
Chromium, total	21614-002	ND	0.002	mg/L	11/14/11 1230	11/15/11	JLH/EPA 200.8
Copper, total	21614-002	0.014	0.002	mg/L	11/14/11 1230	11/15/11	JLH/EPA 200.8
Lead, total	21614-002	0.0005	0.0005	mg/L	11/14/11 1230	11/15/11	JLH/EPA 200.8
Magnesium, total	21614-002	120	0.05	mg/L	11/14/11 1230	11/15/11	JLH/EPA 200.8
Nickel, total	21614-002	ND	0.002	mg/L	11/14/11 1230	11/15/11	JLH/EPA 200.8
Zinc, total	21614-002	0.042	0.002	mg/L	11/14/11 1230	11/15/11	JLH/EPA 200.8

Sample ID: Receiving Water Start
Matrix: Water
Sampled: 11/02/11 0830

Parameter		Result	Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Total solids	21614-010	37000	50	mg/L	11/05/11	11/05/11 0944	EAL/SM2540B
Total suspended solids	21614-010	62	2.5	mg/L	11/05/11	11/05/11 1030	EAL/SM 2540D
Total organic carbon	21614-010	ND	0.4	mg/L	11/21/11	11/21/11	EAL/SM 5310 C
Ammonia-N	21614-009	ND	0.1	mg/L as N	11/21/11 1440	11/21/11 1440	JLH/SM 4500-NH3 G
Aluminum, total	21614-007	0.081	0.02	mg/L	11/14/11 1230	11/20/11	JLH/EPA 200.8
Cadmium, total	21614-007	ND	0.0009	mg/L	11/14/11 1230	11/20/11	JLH/EPA 200.8
Calcium, total	21614-007	340	0.1	mg/L	11/14/11 1230	11/20/11	JLH/EPA 200.8
Chromium, total	21614-007	ND	0.002	mg/L	11/14/11 1230	11/20/11	JLH/EPA 200.8
Copper, total	21614-007	0.033	0.002	mg/L	11/14/11 1230	11/20/11	JLH/EPA 200.8
Lead, total	21614-007	0.015	0.0005	mg/L	11/14/11 1230	11/20/11	JLH/EPA 200.8
Magnesium, total	21614-007	880	0.05	mg/L	11/14/11 1230	11/20/11	JLH/EPA 200.8
Nickel, total	21614-007	ND	0.002	mg/L	11/14/11 1230	11/20/11	JLH/EPA 200.8
Zinc, total	21614-007	0.079	0.002	mg/L	11/14/11 1230	11/20/11	JLH/EPA 200.8

Notes:

ND = Not Detected

ESI

SAMPLE RECEIPT AND CONDITION DOCUMENTATION

STUDY NO:	21614		
SDG No:	Hull		
Project:	Hull		
Delivered via:	**ESI**		
Date and Time Received:	11/02/11 0900	Date and TIme Logged into Lab:	11/03/11 0900
Recieved By:	BS DM	Logged into Lab by:	DM
Air bill / Way bill:	No	Air bill included in folder if received?	NA
Cooler on ice/packs:	YES	Custody Seals present?	NA
Cooler Blank Temp (C) at arrival:	4	Custody Seals intact?	NA
Number of COC Pages:	1		
COC Serial Number(s):	A1006848		
COC Complete:	NO	Does the info on the COC match the samples?	Yes
Sampled Date:	Yes	Were samples received within holding time?	Yes
Field ID complete:	Yes	Were all samples properly labeled?	Yes
Sampled Time:	Yes	Were proper sample containers used?	Yes
Analysis request:	Yes	Were samples received intact? (none broken or leaking)	Yes
COC Signed and dated:	Yes	Were sample volumes sufficient for requested analysis?	Yes
Were all samples received?	Yes	Were VOC vials free of headspace?	NA
Client notification/authorization:	Not required		

Field ID	Lab ID	Mx	Analysis Requested	Bottle	Req'd Pres'n	Verified Pres'n
Effluent Start	21614-001	W	MB48AD StartSample	1x3750 P	4 C	Yes
Effluent Start	21614-002	W	Total Metals Cd,Cr,Ni,Pb,Cu,Zn,Al,Ca,Mg;	250 P	HNO3	Yes
Effluent Start	21614-003	W	TOC	1x40 G	H2SO4	Yes
Effluent Start	21614-004	W	NH3;	125 P	H2SO4	Yes
Effluent Start	21614-005	W	TS,TSS	500 P	4 C	Yes
Receiving Water Start	21614-006	W	MB48AD StartDiluent	2x3750 P	4 C	Yes
Receiving Water Start	21614-007	W	Total Metals Cd,Cr,Ni,Pb,Cu,Zn,Al,Ca,Mg;	250 P	HNO3	Yes
Receiving Water Start	21614-008	W	TOC	1x40 G	H2SO4	Yes
Receiving Water Start	21614-009	W	NH3;	125 P	H2SO4	Yes
Receiving Water Start	21614-010	W	TS,TSS	500 P	4 C	Yes

Notes and qualifications:

Incomplete chain. Date/ time sampled and Sample time were not filled out.
Sent a fax to client to be filled out.

ESI EnviroSystems, Inc.
1 Lafayette Road
Hampton, NH 03842

Voice: 603-926-3345
FAX: 603-926-3521

ESI Job No: 21614

CHAIN OF CUSTODY DOCUMENTATION

Client: United Water - Hull	Contact: Peter Nyberg	Project Name: United Water - Hull WWTF	
Report to: Peter Nyberg	Address: 1111 Nantasket Avenue	Project Number: P0036	Task: 0001
Invoice to: Peter Nyberg	Address: Hull, MA 02045	Project Manager: Peter Nyberg	
Voice: 781-925-0906	Fax: 781-925-3056	email: peter.nyberg@unitedwater.com	P.O.No: ' Quote No:41181

Protocol: NPDES

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or composite (G/C)	Container No	Container Size (mL)	Container Type (P/G/T)	Field Preservation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested\ Special Instructions:
001	Effluent Start					1	3750	P	4 C	Water	N	MB48AD StartSample
002	Effluent Start					1	250	P	HNO3	Water	N	Total Metals Cd,Cr,Ni,Pb,Cu,Zn,Al,Ca,Mg;
003	Effluent Start					1	40	G	H2SO4	Water	N	TOC
004	Effluent Start					1	125	P	H2SO4	Water	N	NH3;
005	Effluent Start					1	500	P	4 C	Water	N	TS,TSS
006	Receiving Water Start					2	3750	P	4 C	Water	N	MB48AD StartDiluent
007	Receiving Water Start					1	250	P	HNO3	Water	N	Total Metals Cd,Cr,Ni,Pb,Cu,Zn,Al,Ca,Mg;
008	Receiving Water Start					1	40	G	H2SO4	Water	N	TOC
009	Receiving Water Start					1	125	P	H2SO4	Water	N	NH3;
010	Receiving Water Start					1	500	P	4 C	Water	N	TS,TSS

Relinquished By: [signature]	Date: 11-2-11 Time: 9:00 am	Received By: [signature]	Date: 11/2/11 Time: 900 am
Relinquished By:	Date: Time:	Received at Lab By:	Date: Time:

Comments: Put at doorway for pick up at 9:00am 11-2-11 4°C upon receipt @ lab 1700 11/2/11

ERR

COC Number: A1006848

Sample Delivery Group No: November 2011		Page of

ESI EnviroSystems, Inc.
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Voice: 781-925-0906	Fax: 781-925-3056	email: peter.nyberg@unitedwater.com	P.O.No: ' Quote No:41181

Protocol: NPDES

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or composite (G/C)	Container No	Container Size (mL)	Container Type (P/G/T)	Field Preservation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:
001	Effluent Start	11/1-2/11	8AM/8AM		C	1	3750	P	4 C	Water	N	MB48AD StartSample
002	Effluent Start	11/1-2/11	8AM/8AM		C	1	250	P	HNO3	Water	N	Total Metals Cd,Cr,Ni,Pb,Cu,Zn,Al,Ca,Mg;
003	Effluent Start	11/1-2/11	8AM/8AM		C	1	40	G	H2SO4	Water	N	TOC
004	Effluent Start	11/1-2/11	8AM/8AM		C	1	125	P	H2SO4	Water	N	NH3;
005	Effluent Start	11/1-2/11	8AM/8AM		C	1	500	P	4 C	Water	N	TS,TSS
006	Receiving Water Start	11/2/11	8:30AM		G	2	3750	P	4 C	Water	N	MB48AD StartDiluent
007	Receiving Water Start	11/2/11	8:30AM		G	1	250	P	HNO3	Water	N	Total Metals Cd,Cr,Ni,Pb,Cu,Zn,Al,Ca,Mg;
008	Receiving Water Start	11/2/11	8:30AM		G	1	40	G	H2SO4	Water	N	TOC
009	Receiving Water Start	11/2/11	8:30AM		G	1	125	P	H2SO4	Water	N	NH3;
010	Receiving Water Start	11/2/11	8:30AM		G	1	500	P	4 C	Water	N	TS,TSS

Relinquished By: [signature] Date: 11-2-11 Time: 9:00 am
Received By: [signature] Date: 11/2/11 Time: 900 am

Relinquished By: Date: Time:
Received at Lab By: Date: Time:

Comments: Put at doorway for pick up at 9:00am 11-2-11 4°c upon receipt @ lab 1700 11/2/11

ERR

COC Number: A1006848

Sample Delivery Group No: November 2011 Page of